Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 11(3): 1634, April 2015 doi: http://dx.doi.org/10.15560/11.3.1634
ISSN 1809-127X © 2015 Check List and Authors

# First record of the assassin bug genus *Coilopus* Elkins, 1969 (Hemiptera: Heteroptera: Reduviidae) from Colombia

**Dimitri Forero**[1*] and **Nicolás Giraldo-Echeverry**[1, 2]

1 Pontificia Universidad Javeriana, Departamento de Biología, Laboratorio de Entomología, UNESIS, Carrera 7 No. 43-82, Bogotá, Colombia
2 Pontificia Universidad Javeriana, Facultad de Estudios Ambientales y Rurales, Transversal 4 No. 42-00, Edificio J. Rafael Arboleda, S.J., Bogotá, Colombia
* Corresponding author. E-mail: forero-i@javeriana.edu.co

**Abstract:** The assassin bug genus *Coilopus* Elkins, 1969 is recorded for the first time from Colombia. *Coilopus vellus* Elkins, 1969 is a wasp mimic that was previously recorded from Costa Rica, French Guiana, and Brazil. The Colombian specimens fill the distributional gap between the known Central and South American records. In addition, based on collected wasps from the same place as *Coilopus*, *Mischocyttarus* sp. (Vespidae: Polistinae) is proposed as the hymenopteran model of this mimetic harpactorine.

**Key words:** Harpactorinae, Harpactorini, mimetism, Neotropical region

Reduviidae, or assassin bugs, are the second-most speciose family of Heteroptera, with nearly 7,000 species described (Maldonado 1990; Henry 2009). Of the 25 subfamilies recognized (Villiers 1963; Davis 1969; Putshkov and Putshkov 1985; Hwang and Weirauch 2012), Harpactorinae is the largest and most diverse, with more than 2,000 described species (Putshkov and Putshkov 1988; Maldonado 1990; Zhang and Weirauch 2014). In the Neotropical region two tribes are recognized (Schuh and Slater 1995), Apiomerini with 12 extant genera (Forero et al. 2011), and Harpactorini with 52 native genera (Bérenger 2003, 2007; Forero et al. 2008; McPherson and Ahmad 2011; Forero 2012), and one introduced, *Amphibolus* Klug, 1830 (Forero et al. 2004).

For most genera of Neotropical Harpactorini the only available data is their original description, in most cases without any mention in the literature afterwards (e.g., *Ambastus* Stål, 1872; *Carmenula* Maldonado, 1992; *Ecelenodalus* Elkins & Wygodzinsky, 1957; *Thysanuchus* Bergroth, 1918), or without any modern taxonomic treatment (Forero et al. 2008). This has led to confusion about the generic circumscription of a number of taxa and resulted in a number of synonyms among Neotropical genera (Gil-Santana and Forero 2009; Swanson 2012). If taxonomic information is scant, biological data are basically non-existent for most Neotropical Harpactorini. *Coilopus* Elkins, 1969 is a harpactorine genus resembling wasps (Elkins 1969), for which no biological information is available. *Coilopus* has been recorded from Costa Rica, French Guiana, and Brazil (Elkins 1969; Gil-Santana and Forero 2009).

During fieldwork at Reserva El Caduceo (Colombia, Meta, San Martín), a few specimens of *Coilopus* were found. They represent a new generic record from Colombia.

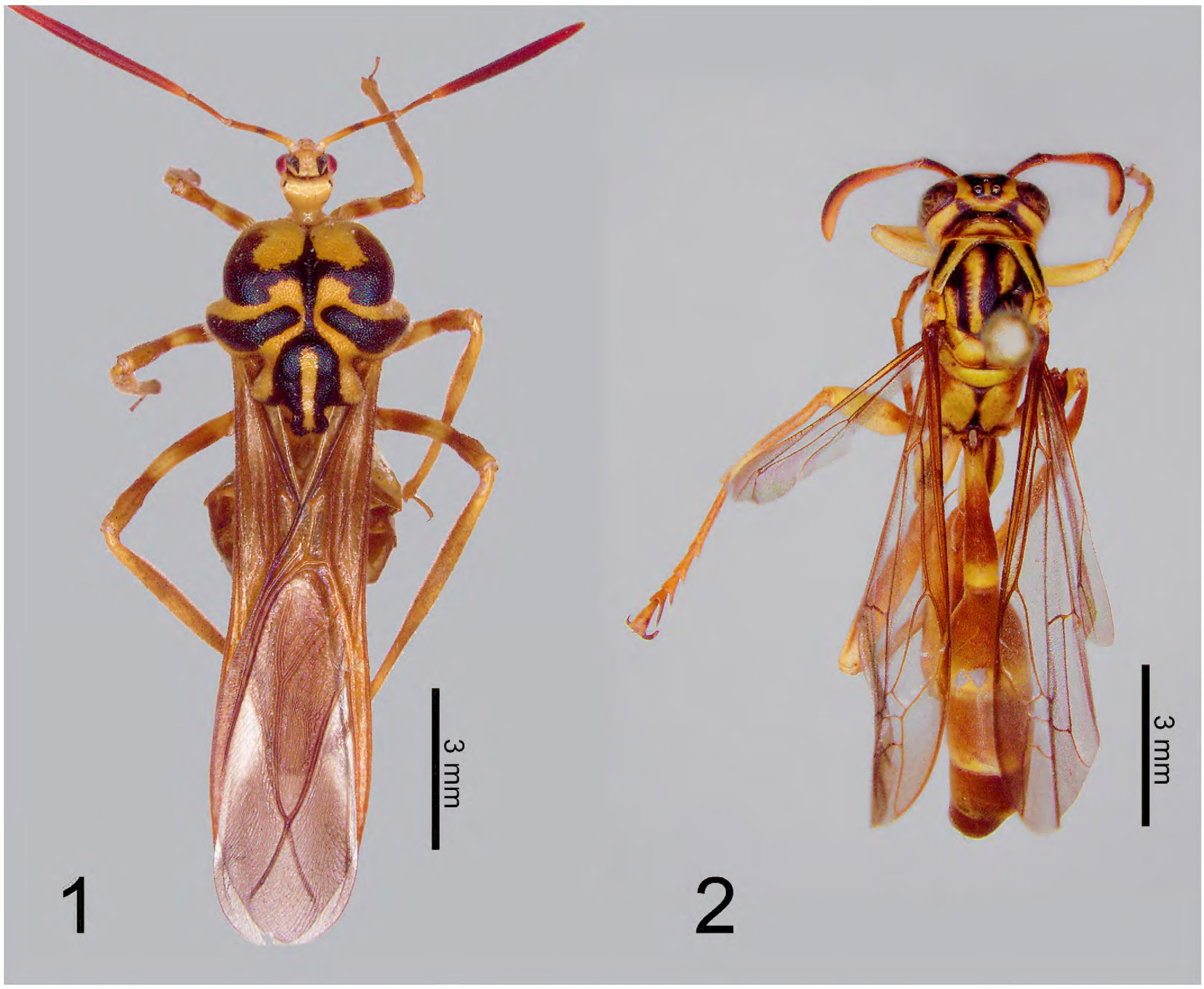
The Reserva Natural El Caduceo is located in the municipality of San Martín (Meta, Colombia), at 03.66553° N, 073.65831° W, with an elevation of 309 m above sea level. The specimens were manually collected between 10–14 March 2014. All examined specimens are deposited in the Entomological collection of the Museo Javeriano de Historia Natural (MPUJ), of the Pontificia Universidad Javeriana, Bogotá, Colombia.

MATERIAL EXAMINED: 1 female, COLOMBIA, Meta, San Martín, Reserva Natural El Caduceo, km 4.5 to San Francisco, 309 m, 03.66553° N, 073.65831° W, 10–14 March 2014, L. Rodríguez leg. / Pastizal / *Coilopus vellus* Elkins, 1969 det. D. Forero 2014 / MPUJ_ENT 0017415; 1 female, idem, L. García leg. / Bosque de Galería / *Coilopus vellus* Elkins, 1969 det. D. Forero 2014 / MPUJ_ENT 0017416.

***Coilopus*** Elkins, 1969

*Coilopus* Elkins (1969): 456 [gen. nov., description]; Putshkov and Putshkov (1985): 39 [catalog]; Maldonado (1990): 178 [catalog].

*Notocyrtoides* Carvalho, Costa and Gil-Santana (2001): 1 [gen. nov., description]; Gil-Santana and Forero (2009): 56 [synonym of *Coilopus*].




**Figures 1 and 2.** *Coilopus vellus* Elkins and its putative model. **1:** Female dorsal habitus of *C. vellus* [MPUJ_ENT 0017416]. **2:** Dorsal habitus of *Mischocyttarus* sp. (Vespidae), the putative mimic model of *C. vellus* [MPUJ_ENT 0017414].

DIAGNOSIS: Medium sized (11–14 mm); head with paired, long spine-like post antennal tubercles; antenna with basiflagellomere incrassate; legs long and narrow, all femora slender, mid and hind tibiae slightly incrassate; pronotum inflated, finely punctuated, prolonged posteriorly covering at most basal abdominal segment, divided in three lobes, first lobe broadly rounded on anterior margin, second lobe laterally expanded as sharp lateral prolongations, third lobe constricted basally with paired lateral prolongations and apically truncate; hemelytron surpassing abdomen for about a third of its length; abdomen strongly constricted at base; male paramere well developed and externally visible.

***Coilopus vellus*** Elkins, 1969 (Figure 1)

*Coilopus vellus* Elkins (1969): 460 [sp. nov., description]; Putshkov and Putshkov (1988): 42 [catalog]; Maldonado (1990): 178 [catalog]; Zhang and Weirauch (2013): 4 [sticky glands].

*Notocyrtoides tuberculatus* Carvalho, Costa and Gil-Santana (2001): 1 [sp. nov., description]; Gil-Santana and Forero (2009): 56 [as synonym of *Coilopus*].

DIAGNOSIS: Foretibia with apical spur; longitudinal median sulcus of pronotum reaching hind lobe of pronotum; male genitalia with dorsal phallothecal sclerite broad, anteriorly pointed.

Maldonado and Lozada (1992) stated that *Coilopus* resembles bees, although Elkins (1969) had already suggested it to be a wasp mimic, similar to *Dolichovespula* Rohwer or *Vespa* Linnaeus. The Colombian specimens of *C. vellus* when alive resembled a small wasp in their movements and general appearance. Several species of Vespidae occur in the reserve, but there is a species of *Mischocyttarus* (Vespidae: Polistinae) at El Caduceo which is very similar to *C. vellus*, both in structure and coloration (Figure 2). Unlike *Dolichovespula* and *Vespa*, which do not have Neotropical distribution, *Mischocyttarus* is mostly Neotropical in distribution (Carpenter 1993; Silveira 2008). This species

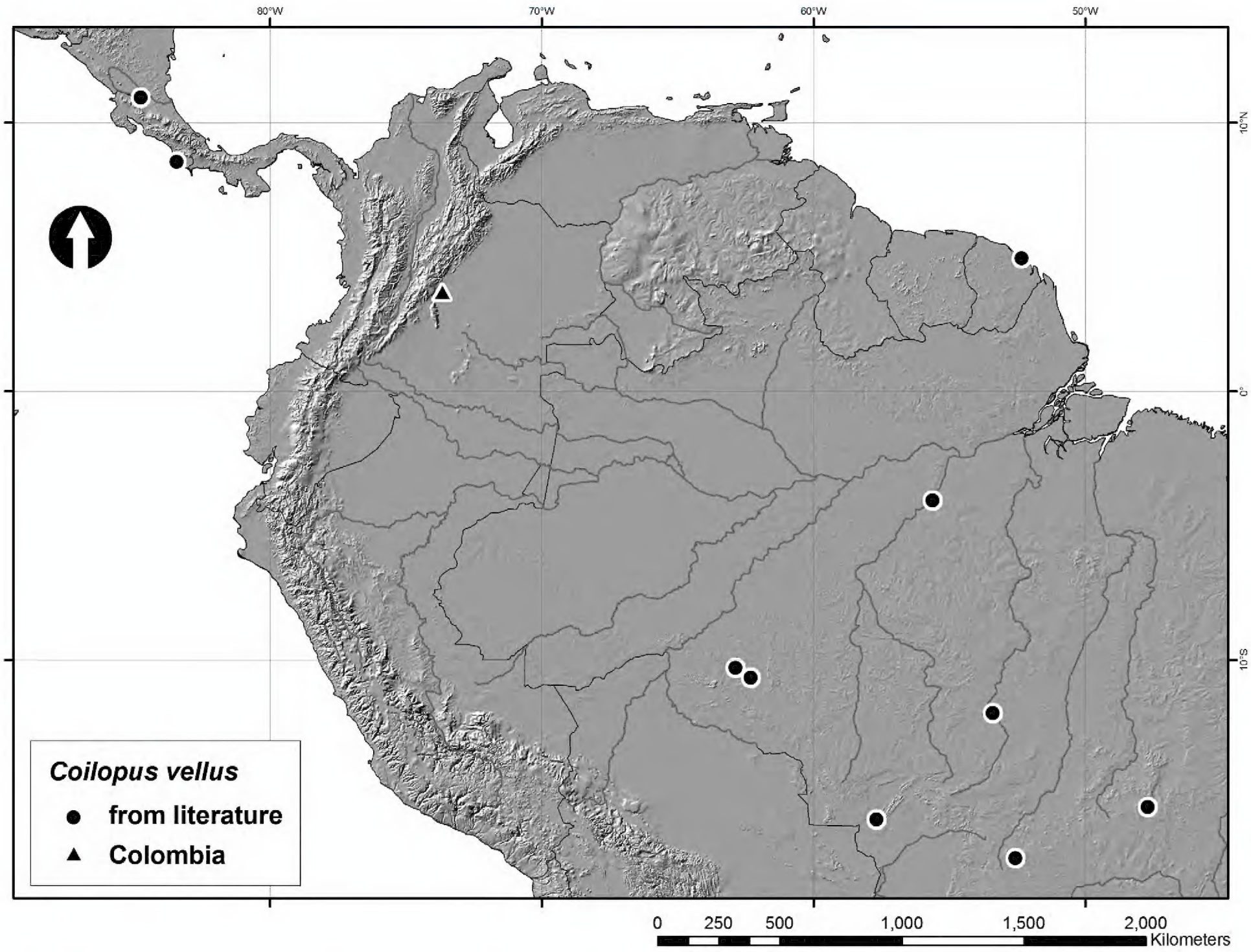



**Figure 3**. Distribution of *Coilopus vellus* Elkins. Circles are recorded localities from the literature and the triangle indicates the placement of the Colombian locality of the examined specimens.

of *Mischocyttarus* has a similar coloration to *C. vellus*, being mostly pale yellow, with the pronotum yellow with a contrasting dark pattern, and a banded abdomen with pale brown tergites (Figure 2). Although *C. vellus* is more robust than this *Mischocyttarus* species, it structurally resembles this wasp due to the similar total length, enlarged antennal basiflagellomere, and constricted abdominal base (Figure 2). Despite some structural and minor obvious color differences, we think that the resemblance is striking. The black markings on the rounded anterior lobe of the enlarged pronotum in *Coilopus* might correspond to the pair of compound eyes of the vespid, with the black markings of the other lobes of the pronotum vaguely resembling the dark markings on the thorax of *Mischocyttarus*. Nonetheless, the nearly horizontal black markings on the second pronotal lobe in *Coilopus* do not fully correspond to any structure or color pattern in the wasp. Overall, the striking black and yellow color pattern and the particular structural modifications in *Coilopus* might be considered a case of imperfect mimicry, which might be still advantageous (e.g., Penney et al. 2012).

El Caduceo reserve protects a relict of gallery forest surrounded by a matrix of anthropogenic grassland. Specimens of *C. vellus* were collected in both types of habitats. The area where the reserve is located belongs to the biogeographic Sabana province (Hernández et al. 1992; Morrone 2014), an area which is currently a highly transformed landscape (Etter et al. 2008). Given that *C. vellus* was found in both a gallery forest and open grassland, this might indicate that this species is not habitat specific, explaining in part its widespread distribution in the Neotropical region.

*Coilopus vellus* was previously known from Costa Rica (Provincia Puntarenas: Estacion Agujas [08.5348° N, 083.4267° W]; Provincia Alajuela: Playuelas [10.9553° N, 084.7496° W]), French Guiana (Cayenne), and Brazil (Goiás: Mineiros; Pará: Serra Norte Pedreira; Rondônia: 62 km southwest of Ariquemes, Ouro Preto do Oeste; Mato Grosso: Parque Nacional do Xingu, Cáceres; Distrito Federal: 32 km north of Brasilia at Embrapa [15.5833° S, 047.7000° W], 32 km north of Brasilia near Planaltina) (Elkins 1969; Carvalho et al. 2001; Gil-Santana and Forero 2009). All the known localities for this species are in lowland areas. The presence of this species in Colombia not only represents a new record from Colombia but fills the distributional gap for this species as well (Figure 3).

## ACKNOWLEDGEMENTS

Dr. Miguel Suárez kindly allowed to us to visit the reserve El Caduceo and facilitated our work there. Carlos Sarmiento (Instituto de Ciencias Naturales, Bogotá) helped us identify the *Mischocyttarus* wasp. Jean-Michel Bérenger and Guanyang Zhang kindly provided criticism that improved the manuscript. We thank the members of the Invertebrate Zoology course 2014-I for the company and help during fieldwork. This paper is a contribution of the project "Actividades docentes como apoyo al conocimiento de la biodiversidad colombiana" ID PPTA 00006416 of the Pontificia Universidad Javeriana.

## LITERATURE CITED

Bérenger, J.M. 2003. *Iquitozelus couturieri*, nouveaux genre et nouvelle espèce d'Harpactorinae du Pérou (Heteroptera, Reduviidae). Nouvelle Revue d'Entomologie (N. S.) 20: 23–27.

Bérenger, J.M. 2007. Hétéroptères Reduviidae noveaux de Guayane française. II—Harpactorinae, Harpactorini. Bulletin de la Société entomologique de France 112(1): 29–40.

Bergroth, E. 1918. Hendecas generum hemipterorum novorum vel subnovorum. Annales Musei Nationalis Hungarici 16: 298–314.

Carvalho, J.C.M., L.A.A. Costa and H.R. Gil-Santana. 2001. A new genus and species of Neotropical Harpactorinae (Hemiptera-Heteroptera, Reduviidae). Boletim do Museu Nacional, Nova Série, Zoologia 441: 1–4.

Carpenter, J.M. 1993. Biogeographic patterns in the Vespidae (Hymenoptera): two views of Africa and South America; pp. 139–155, in: P. Goldblatt (ed.). Biological relationships between Africa and South America. New Haven and London: Yale University Press.

Davis, N.T. 1969. Contribution to the morphology and phylogeny of the Reduvioidea. Part IV. The Harpactoroid complex. Annals of the Entomological Society of America 62(1): 74–94. doi: 10.1093/aesa/62.1.74

Elkins, J.C. 1969. A new genus of hemipteran wasp mimics (Reduviidae, Harpactorinae). Journal of the Kansas Entomological Society 42(4): 456–457. doi: 10.2307/25083824

Elkins, J.C. and P. Wygodzinsky. 1957. A new Neotropical harpactorine genus (Reduviidae, Hemiptera). Revista Brasileira de Biologia 17(2): 203–210.

Etter, A., C. McAlpine and H. Possingham. 2008. Historical patterns and drivers of landscape change in Colombia Since 1500: A regionalized spatial approach. Annals of the Association of American Geographers 98(1): 2–23. doi: 10.1080/00045600701733911

Forero, D. 2012. *Pronozelus*, a new Neotropical harpactorine genus and species from Colombia (Hemiptera: Heteroptera: Reduviidae: Harpactorinae). Entomologica Americana 118(1): 278–284. doi: 10.1664/12-RA-021.1

Forero, D., C. Weirauch and M. Baena. 2004. Synonymy of the reduviid (Hemiptera: Heteroptera) genus *Torrealbaia* (Triatominae) with *Amphibolus* (Harpactorinae), with notes on *Amphibolus venator* (Klug, 1830). Zootaxa 670: 1–12. http://www.mapress.com/zootaxa/2004f/z00670f.pdf

Forero, D., H.R. Gil-Santana and P.H. van Doesburg. 2008. Redescription of the Neotropical genus *Aristathlus* (Heteroptera, Reduviidae, Harpactorinae); pp. 85–103, in: S. Grozeva and N. Simov (eds.). Advances in Heteroptera research: festschrift in honor of 80th anniversary of Michail Josifov. Sofia-Moscow: Pensoft.

Forero, D., D.H. Choe and C. Weirauch. 2011. Resin gathering in Neotropical resin bugs (Insecta: Hemiptera: Reduviidae): functional and comparative morphology. Journal of Morphology 272(2): 204–229. doi: 10.1002/jmor.10907

Gil-Santana, H.R. and D. Forero. 2009. A new species of *Notocyrtus*, a new synonym of *Coilopus*, and new records and notes on other Harpactorini (Hemiptera: Heteroptera: Reduviidae: Harpactorinae) from South America. Zootaxa 2148: 55–67. http://www.mapress.com/zootaxa/2009/f/z02148p067f.pdf

Henry, T.J. 2009. Biodiversity of Heteroptera; pp. 223–263, in: R.G. Foottit and P.H. Adler (eds). Insect Biodiversity: Science and Society. Oxford, UK: Blackwell Publishing. doi: 10.1002/9781444308211.ch10

Hernández, J., A. Hurtado, R. Ortiz and T. Walschburger. 1992. Unidades biogeográficas de Colombia; pp. 105–155, in: G. Halffter (ed.). La diversidad biológica de Iberoamérica. Xalapa, México: Instituto de Ecología.

Hwang, W.S. and C. Weirauch. 2012. Evolutionary history of assassin bugs (Insecta: Hemiptera: Reduviidae): Insights from divergence dating and ancestral state reconstruction. *PLoS ONE* 7(9): e45523 (10.1371/journal.pone.0045523).

Klug, J.C.F. 1830. Symbolae physicae seu icones et descriptiones insectorum quae ex itinere per Africam borealem et Asiam occidentalem. Insecta. Percensuit Dr. Fr. Klug. In: Ehrenberg, C.G.: Symbolae physicae. Zoologica. Symbolae physicae, seu Icones adhuc ineditae corporum naturalium novorum aut minus cognitorum, quae ex itineribus per Libyam, Aegyptum, Nubiam, Dongalam, Syriam, Arabiam et Habessiniam, publico institutis sumptu Friderici Guilelmi Hemprich et Christiani Godofredi Ehrenberg. Regis iussu et impensis publico usui obtulit superstes Dr. C. G. Ehrenberg, Berolini, ex Officina academica, venditur a Mittlero, 93 pp.

Maldonado, J. 1990. Systematic catalogue of the Reduviidae of the world. Caribbean Journal of Science, Special publication No. 1: 694 pp.

Maldonado, J. 1992. A new Harpactorinae genus from French Guiana, northern South America (Heteroptera: Reduviidae). Caribbean Journal of Science 28(1–2): 38–40.

Maldonado, J. and P.W. Lozada. 1992. Key to the group of Neotropical wasp-mimetic Harpactorinae genera and the description of a new species (Hemiptera: Reduviidae). Proceedings of the Entomological Society of Washington 94(1): 162–165. http://www.biodiversitylibrary.org/page/16245211

McPherson, J.E. and I. Ahmad. 2011. *Parasinea*, a new genus of assassin bug, with description of a new species from Colombia (Hemiptera: Heteroptera: Reduviidae). Annals of the Entomological Society of America 104: 1285–1291. doi: 10.1603/AN11128

Morrone, J.J. 2014. Biogeographical regionalisation of the Neotropical region. Zootaxa 3782: 1–110. doi: 10.11646/zootaxa.3782.1.1

Penney, H.D., C. Hassall, J.H. Skevington, K.R. Abbott and T.N. Sherratt. 2012. A comparative analysis of the evolution of imperfect mimicry. Nature 483: 461–464. doi: 10.1038/nature10961

Putshkov, V.G. and P.V. Putshkov. 1985. A catalogue of assassin-bug genera of the world (Heteroptera, Reduviidae). Kiev: Published by the authors, deposited in VINITI [All Russian Institute for Scientific and Technical Information], No. 4738-B 85. [Russian preface, English main text]. 138 pp.

Putshkov, V.G. and P.V. Putshkov. 1988. A catalogue of assassin-bugs of the World (Heteroptera, Reduviidae). III. Harpactorinae. Kiev: Published by the authors, deposited in VINITI [All Russian Institute for Scientific and Technical Information], No. 286-B 88. [Russian preface, English main text]. 264 pp.

Schuh, R.T. and J.A. Slater. 1995. True bugs of the world (Hemiptera: Heteroptera): classification and natural history. Ithaca: Comstock Publishing Associates, Cornell University Press. 336 pp.

Silveira, O.T. 2008. Phylogeny of wasps of the genus *Mischocyttarus*

de Saussure (Hymenoptera, Vespidae, Polistinae). Revista Brasileira de Entomologia 52(4): 510–549. doi: 10.1590/S0085-56262008000400004

Stål, C. 1872. Enumeratio Hemipterorum. Bidrag till en förteckning öfver alla hittills kända Hemiptera, jemte systematiska meddelanden. 2. Kongliga Svenska Vetenskaps-Akademiens Handlingar 10: 1–159. http://biodiversitylibrary.org/page/12796855

Swanson, D.R. 2012. A new synonymy in the Harpactorinae of the New World (Heteroptera: Reduviidae). Proceedings of the Entomological Society of Washington 114(2): 250–254. doi: 10.4289/0013-8797.114.2.250

Villiers, A. 1963. La réserve naturelle intégrale du Mont Nimba. XXV. Hemiptera Reduviidae. Mémoires de l'Institut français d'Afrique Noire 66: 479–565.

Zhang, G. and C. Weirauch. 2013. Sticky predators: a comparative study of sticky glands in harpactorine assassin bugs (Insecta: Hemiptera: Reduviidae). Acta Zoologica 94(1): 1–10. doi: 10.1111/j.1463-6395.2011.00522.x

Zhang, G. and C. Weirauch. 2014. Molecular phylogeny of Harpactorini (Insecta: Reduviidae): correlation of novel predation strategy with accelerated evolution of predatory leg morphology. Cladistics 30(4): 339–351. doi: 10.1111/cla.12049

**Authors' contribution statement:** DF identified the specimens, took the photographs, and made the maps, DF and NGE wrote the paper.

**Received:** October 2014
**Accepted:** March 2015
**Editorial responsibility:** Aline dos Santos